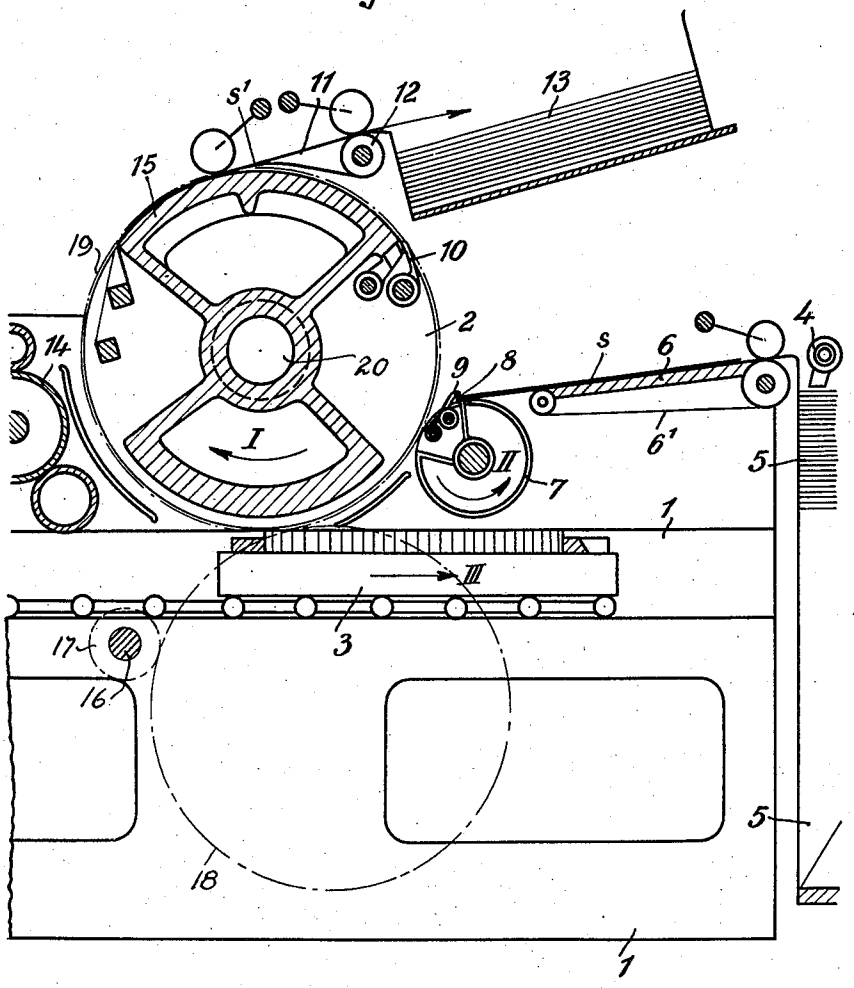
March 28, 1939. A. BÜTTNER 2,151,838

SINGLE-REVOLUTION CYLINDER PRINTING PRESS

Filed Feb. 26, 1937 2 Sheets-Sheet 1

Fig. 1



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Fig. 2

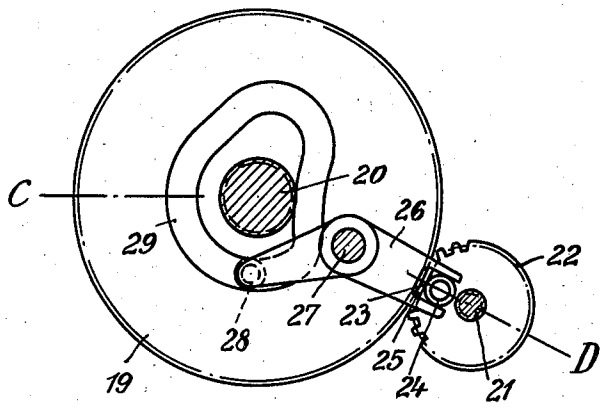
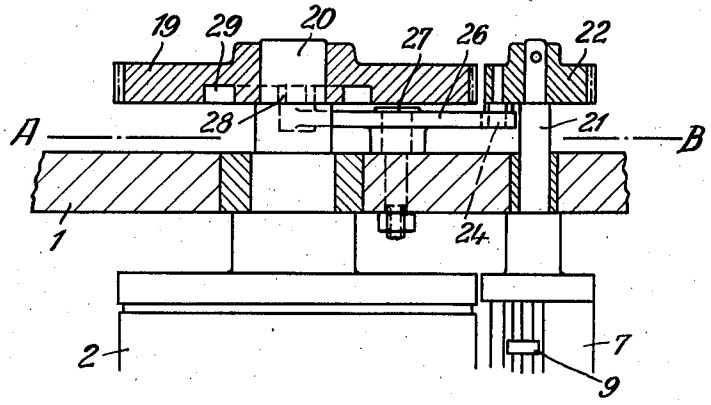


Fig. 3



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SINGLE-REVOLUTION CYLINDER PRINTING PRESS

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Application February 26, 1937, Serial No. 128,000
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4 Claims. (Cl. 101—278)

My invention which relates to a single-revolution cylinder printing press is characterized by the essential feature that the direction of revolution of the continually rotating impression cylinder is such that the sheets are supplied to this cylinder from below and are delivered above the sheet feeding device with the printed surface upward.

With double-revolution cylinder printing presses it is known to lay-on the sheets onto the impression cylinder automatically from below and to deliver them above the feeding means. It had however, not been discovered up to now that with single-revolution cylinder printing presses the automatic feeding of the sheets at the lower side of the impression cylinder renders possible to deliver the printed sheets without turning them over. Hitherto the automatic delivery of the sheets has, as regards single-revolution cylinder printing presses which present over the double-revolutions presses and the stop-cylinder printing presses advantages in several respects, been connected with difficulties because the cylinder performs only one revolution at every impression. It was, therefore, necessary to insert into the path of the sheets a turning-over device which rendered it possible to deliver the sheets printed side up, but this turning-over operation entails considerable disadvantages.

The present invention obviates these disadvantages, in that the sheets after having been printed can be delivered without having been turned over and can be laid off with the printed surface upward.

It is suited to the purpose in view to design and arrange the members concerned in the manner that the transfer of the sheets from the position of rest into the speed of the impression cylinder is effected by means of a laying-on device which is at rest when it receives the sheet and then conveys the sheet to the grippers of the impression cylinder at the lower side of the latter. For this purpose a feeding cylinder can be used which only temporally performs a revolution in order to transfer the sheet to the grippers of the impression cylinder and have it seized by said grippers, whereas said feeding cylinder is at rest during the other portion of the time in which the impression cylinder rotates, this portion of time being utilized for laying-on the sheet and registering it. From this reason the size of the feeding cylinder is preferably so chosen that the circumference of the same amounts to one third of the circumference of the impression cylinder, and the feeding cylinder remains, therefore, at rest during approximately two thirds of one revolution of the impression cylinder whereby even with high working speeds favorable periods of time for the laying-on and the registration of the sheet are obtained.

The invention is illustrated diagrammatically and by way of example on the accompanying drawings which show in Fig. 1, a transverse vertical section through the arrangement and combination of parts constituting my invention. Fig. 2 is a vertical section on line A—B of Fig. 3 and Fig. 3 is a horizontal section on line C—D of Fig. 2.

On the drawings, 1 denotes the frame of the printing press in which the rotatory impression cylinder 2 is supported; it is continually rotated in the direction indicated by the arrow I from the main driving shafts 16 by means of a gear wheel 17 which engages a larger wheel 18. The latter engages a gear wheel 19 of the same size which is fixed to the shaft 20 of the impression cylinder 2. 3 denotes the composition bed which is reciprocated in the frame 1 in the proper manner. The impression cylinder 2 performs one complete revolution while said bed 3 is moved one time to and fro.

14 are the rollers of the well known inking device.

The sheet s to be printed which is lifted from the pile 5 by means of suckers 4 or the like and is then placed upon the feeding table 6 is moved along over this table by driven tapes 6^1 and conducted to a laying-on cylinder 7 provided with laying-on marks 8 and grippers 9. While the sheet is laid-on and registered, the cylinder 7 is at rest. As soon as the sheet has been registered and then been seized by the grippers 9 of the still stationary cylinder 7, this commences to rotate in the direction indicated by the arrow II. The driving relations are so chosen that the cylinder 7, when its grippers 9 stand opposite the grippers 10 of the impression cylinder in order to transfer the sheet, has the same circumferential speed as the impression cylinder. The sheet transferred to the impression cylinder is now printed, the composition bed 3 being moved during this time opposite to the direction indicated by the arrow III. The printed sheet s^1 is then, while the cylinder 2 continues to rotate, withdrawn from the impression cylinder by means of strippers 11 and conveyed to the delivery rollers 12 by which the sheet is further conveyed to and onto the delivery pile 13 printed side up.

The diameter of the feeding cylinder 7 amounts, in the constructional form shown by way of example, to one third of the diameter of the impression cylinder 2. Owing hereto, time is saved for the laying-on and the registration of the sheet, because for the conveyance of a sheet to the grippers 10 of the cylinder only an ample third of one revolution of the impression cylinder is required, if the period of time

necessary for the acceleration of the circumferential speed of the cylinder 7 from zero to the speed of the impression cylinder is paid regard to so that for the laying-on and the registration of the sheet nearly two thirds of one revolution of the impression cylinder remains.

As with a single-revolution cylinder printing press the printing segment 15 amounts to about one fourth of the circumference of the impression cylinder, there is, with a feeding cylinder, the diameter of which presents a ratio of 1:3 relatively to the diameter of the impression cylinder the largest possible size of sheet already amply wound off when the feeding cylinder comes to stand-still for the feeding of the next sheet. The temporal ratios become, therefore, favorable for the laying-on and the registration of the sheet which is advantageous especially in the case of high working speeds.

It is, of course, possible to choose another ratio of the diameter of the feeding cylinder relatively to the diameter of the impression cylinder, for instance 1:2.

The intermittent drive of the feeding cylinder 7 takes place in the following manner:

On the shaft 21 of the feeding cylinder 7 a toothed wheel 22 is mounted which is adapted to engage in the toothed wheel 19 but which is not provided with teeth on its entire periphery but is flattened at 23. A roller 24 is rotatably mounted laterally on the toothed wheel 22 in the vicinity of the flattened part. The said roller 24 engages in the position of the feeding cylinder in the notch 25 of a two armed lever 26 which is rotatably mounted on the machine frame 1 on a pivot 27. The other end of the two armed lever 26 carries a roller 28 which engages in a control curve 29 provided in the wheel 19. During the rotation of the impression cylinder 2, which makes one rotation per impression, the control curve 29, which also makes one rotation per impression, acts on the two armed lever 26 in such a manner that this lever rotates the feeding cylinder 7 to a small extent so that the toothed wheel 22 mounted on the shaft 21 of the feeding cylinder 7 engages with the toothed wheel 19. The feeding cylinder is thereby rotated. As soon as the feeding cylinder has performed one complete revolution during which the sheet S has been taken over by the impression cylinder 2, the wheel 22, becomes disengaged from the wheel 19. The lever 26 has meanwhile been rotated by the control curve 29 so that the roller 24 again enters the notch 25 of the lever 26. In this position (see Fig. 2) the roller is held by the lever 26 until the impression cylinder has performed one complete revolution. During this period, the feeding cylinder 7 is therefore locked in its position for the laying-on and registration of the next sheet.

The arrangement may be such that the wheel 22 does not engage with the driving wheel 19 for the impression cylinder but with a toothed segment secured to the shaft 20 of the impression cylinder.

Instead of the said feeding cylinder reciprocating oscillating grippers might be used, but with high working speeds the employment of a feeding cylinder is to be preferred because this cylinder is rotated only in one direction and accelerations and retardations are, therefore, necessary likewise in one direction only.

I claim:

1. A single-revolution cylinder printing press comprising in combination, a continually rotating impression cylinder and a reciprocating form bed, a gear drive for rotating said cylinder in such direction that the printed sheets are delivered at the upper side of the impression cylinder, a feeding table, feeding means located near the lower side of said impression cylinder and arranged between the latter and said feeding table, said feeding means being adapted to transfer the sheet to be printed from said feeding table to said impression cylinder so that turning over of the printed sheet is avoided, means driven from said impression cylinder for intermittently driving said feeding means, and delivery means for conveying the printed sheet from the upper side of said impression cylinder to a delivery pile.

2. A single-revolution cylinder printing press comprising in combination, a continually rotating impression cylinder and a reciprocating form bed, a gear drive for rotating said cylinder in such direction that the printed sheets are delivered at the upper side of the impression cylinder, a feeding table, feeding grippers located near the lower side of said impression cylinder and arranged between the latter and said feeding table, said feeding grippers being adapted to transfer the sheet to be printed from said feeding table to the grippers of said impression cylinder so that turning-over of the printed sheet is avoided, means driven from said impression cylinder for intermittently actuating said feeding grippers, and delivery means for conveying the printed sheet from the upper side of said impression cylinder to a delivery pile.

3. A single-revolution cylinder printing press comprising in combination, a continually rotating impression cylinder and a reciprocating form bed, a gear drive for rotating said cylinder in such direction that the printed sheets are delivered at the upper side of the impression cylinder, a feeding table, a feeding cylinder located near the lower side of said impression cylinder, laying-on marks on said feeding cylinder, and grippers on said feeding cylinder, said feeding cylinder being adapted to transfer the sheet to be printed from said feeding table to the grippers of said impression cylinder so that turning-over of the printed sheet is avoided, a gear drive in connection with said impression cylinder for intermittently rotating said feeding cylinder, and delivery means for conveying the printed sheet from the upper side of said impression cylinder to a delivery pile.

4. A single-revolution cylinder printing press comprising in combination, a continually rotating impression cylinder, and a reciprocating form bed, a gear drive for rotating said cylinder in such direction that the printed sheets are delivered at the upper side of the impression cylinder, a feeding table, a feeding cylinder located near the lower side of said impression cylinder, laying-on marks on said feeding cylinder and grippers on said feeding cylinder, the circumference of the latter being one third of the circumference of said impression cylinder, said feeding cylinder being adapted to transfer the sheets to be printed to said impression cylinder so that turning-over of the printed sheet is avoided, a gear drive in connection with said impression cylinder for intermittently rotating said feeding cylinder, and delivery means for conveying the printed sheet from the upper side of said impression cylinder to a delivery pile.

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